What papers should I cite from my reading list? User evaluation of a manuscript preparatory assistive task

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BACKGROUND

- Information Retrieval (IR) and Recommender Systems (RS) techniques have been used to address:-
  - ✓ Literature Review (LR) search tasks
  - ✓ Explicit and implicit ad-hoc information needs

- Examples of such tasks include
  - ✓ Building a reading list of research papers
  - ✓ Finding similar papers
  - ✓ Recommending papers based on query logs
  - ✓ Recommending papers based on publication history
  - ✓ Serendipitous discovery of interesting papers and more….

What about recommending papers during manuscript preparation (MP)?

ADDRESSED SCENARIOS IN MP

- Recommending papers based on **Citation Contexts** in manuscripts
- Recommending new papers based on **To-Be-Cited** papers from the draft manuscript's bibliography
- Recommending papers based on the **full text of the draft manuscript**

What more could be done?

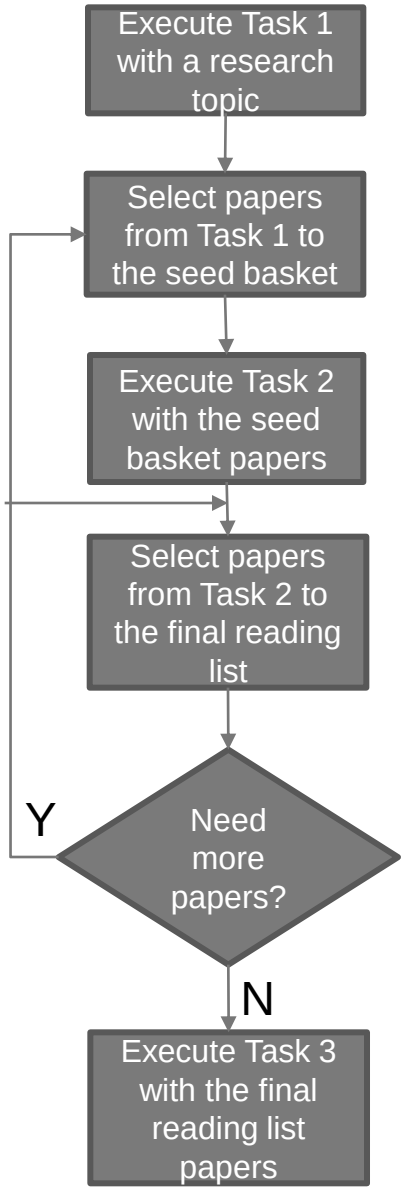
- Few ideas….
- Explore the total list of papers compiled during literature review
- Explore the article-type preference to vary recommendations correspondingly?

ENTER REC4LRW…

- Rec4LRW is a task-based assistive system that offers recommendations for the below tasks:-
  - ❖Task 1 – Building an initial reading list of research papers
  - ❖Task 2 – Finding similar papers based on a seed set of papers (multiple papers)
  - ❖**Task 3 – Shortlisting papers from the final reading list based on article-type preference**

- The system is based on a threefold intervention framework
  1. Task reconceptualization
     - ✓ For better meeting the task requirements
  2. Novel informational display features
     - ✓ For speeding up the relevance judgement decisions
  3. Task interconnectivity
     - ✓ For establishing the natural relationships between tasks

REC4LRW USAGE SEQUENCE



CORPUS

- ACM DL extract of papers published between 1951 and 2011 used as corpus
- 103,739 articles and corresponding 2,320,345 references
- AnyStyle (https://anystyle.io) parser used to extract article title, venue and year from references
- Data stored in a MySQL database with the tables related using a partial snowflake schema

TASK OBJECTIVE AND STEPS

- OBJECTIVE: To identify the important papers from the final reading list and vary recommendations count based on article-type preference

```
Input: P – set of papers in the final reading list
       AT  –   article-type choice of the user
 1: RC ← the average references count retrieved for AT
 2: R ← list of retrieved citations & references of papers from P
 3: G ← directed sparse graph created with papers from R
 4: run edge betweenness algorithm on G to form cluster set C
 5: S ← final list of shortlisted papers
 6: if |C| > RC then
 7:    while |S| = RC
 8:          for each cluster in C do
 9:               sort papers in the cluster on citation count
10:               s ← top ranked paper from the cluster
11:               add s to S
12:          end for
13:   end while
14: else
15:       N ← 0
16.       while |S| = RC
17:             N ← N +1
18:             for each cluster in C do
19:                  sort papers in the cluster on citation count
20:                  s ← N ranked paper from the cluster
21:                  add s to S
22:             end for
23:        end while
24: end if
25: display papers from S to user
```

USER EVALUATION STUDY

- OBJECTIVE: To ascertain the usefulness and effectiveness of the task to researchers

- Ascertain the agreement percentages of the evaluation measures

Measure	Question
Relevance	The shortlisted papers are relevant to my article-type preference
Usefulness	The shortlisted papers are useful for inclusion in my manuscript
Importance	The shortlisted papers comprises of important papers from my reading list
Certainty	The shortlisted list comprises of papers which I would definitely cite in my manuscript
Good_List	This is a good recommendation list, at an overall level
Improvement_Needed	There is a need to further improve this shortlisted papers list
Shortlisting_Feature	I would like to see the feature of shortlisting papers from reading list based on article-type preference, in academic search systems and databases

- Identify the top preferred and critical aspects of the task through the subjective feedback of the participants
  - Feedback responses were coded by a single coder using an inductive approach

STUDY INFORMATION

- The study was conducted between November 2015 and January 2016
- Pre-screening survey conducted to identify participants who have authored at least one journal or conference paper
- 116 participants completed the whole study inclusive of the three tasks in the system
- 57 participants were Ph.D./Masters students while 59 were research staff, academic staff and librarians
- The average research experience for students was 2 years while for staff, it was 5.6 years
- 51% of participants were from the computer science, electrical and electronics disciplines, 35% from information and communication studies discipline while 14% from other disciplines

STUDY PROCEDURE

Step 1: Participant selects one of the available 43 topics for executing task 1

Step 2: Re-run task 1 and select at least five papers for the seed basket

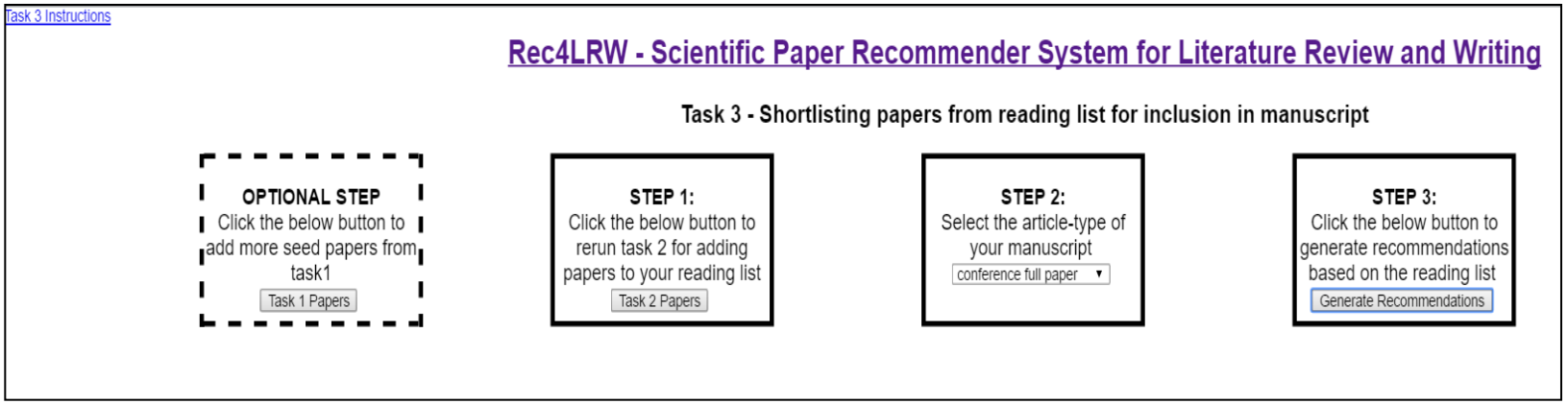
Step 3: Execute task 2 with the seed basket papers

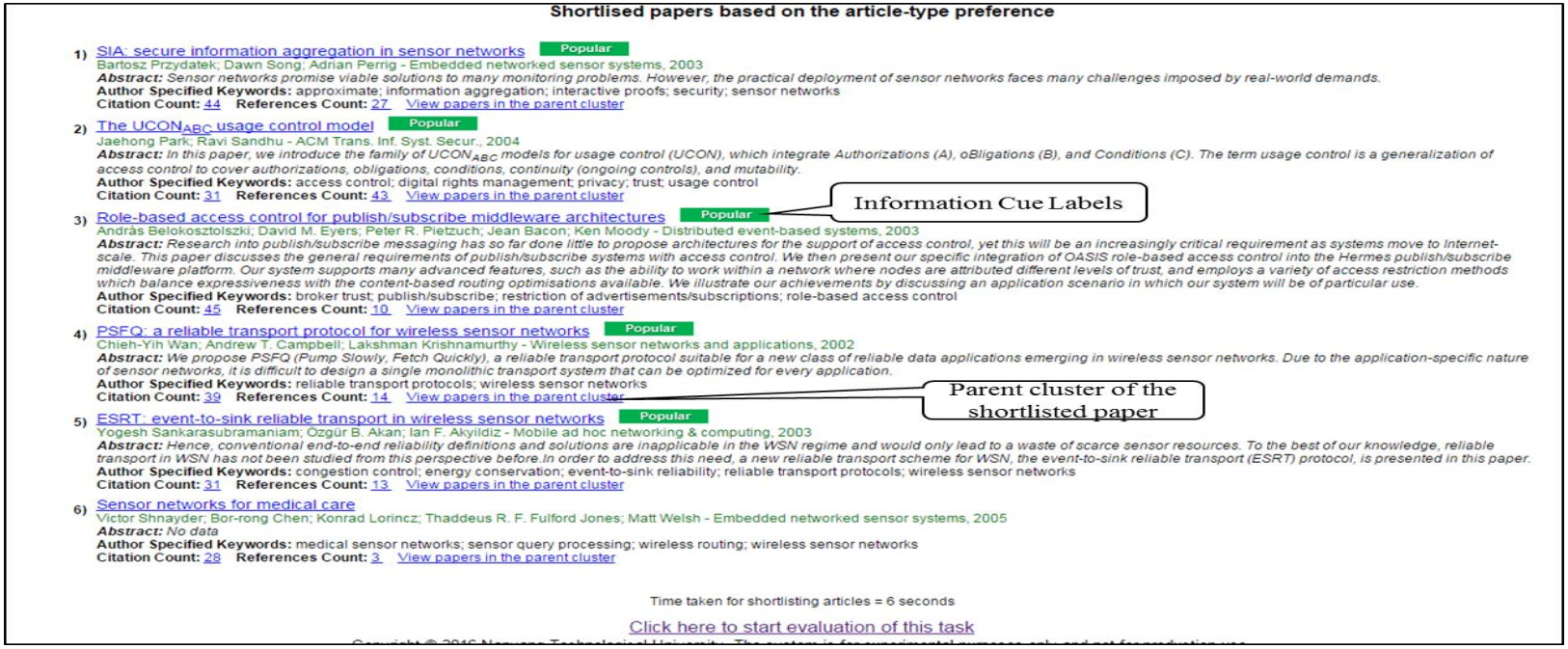
Step 4: Re-run task 2 (and task 1) to select at least 30 papers for the final reading list

Step 5: Execute task 3 with the final reading list papers and article-type preference

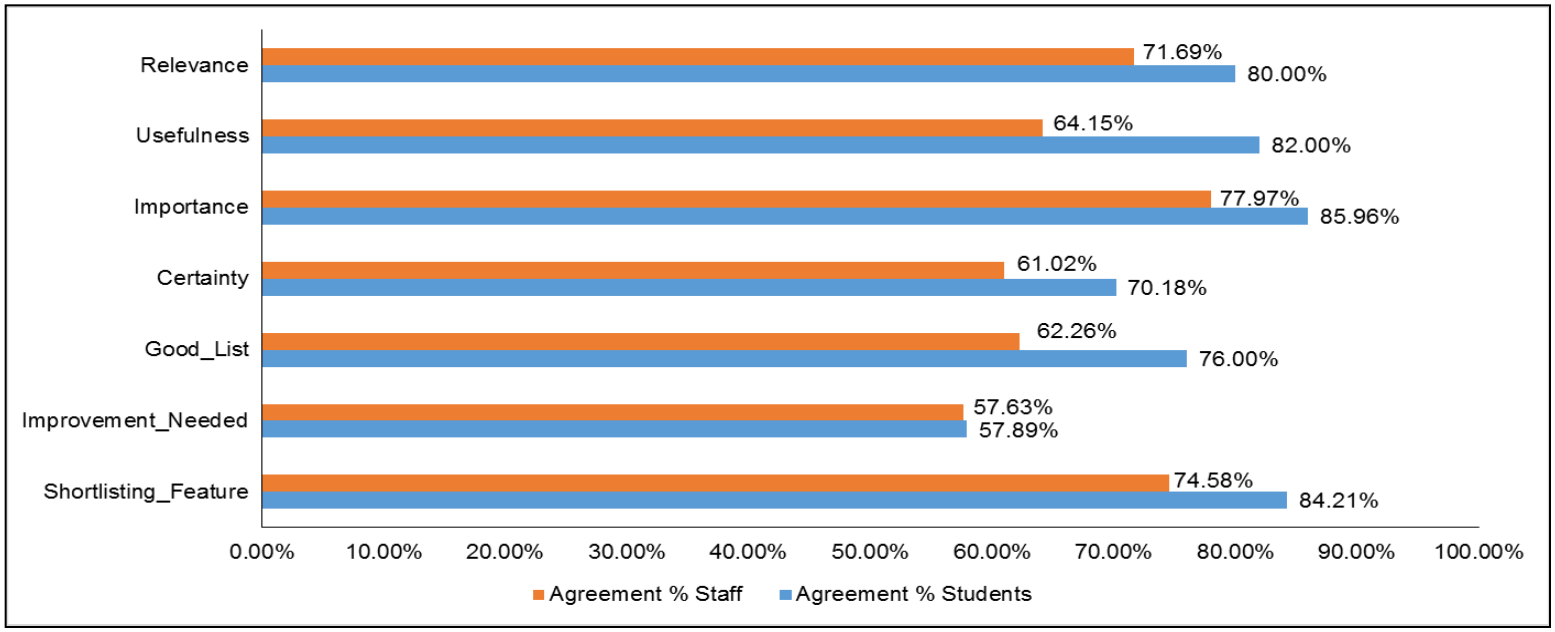
- Four article-type choices: conference full paper, poster, case study and a generic research paper

SCREENSHOTS





RESULTS



- Biggest differences found for the below measures:-
  - Usefulness (82.00% for students, 64.15% for staff)
  - Good_List (76.00% for students, 62.26% for staff)

- The measures with the highest agreement:-
  - Importance (85.96% for students, 77.97% for staff)
  - Shortlisting_Feature (84.21% for students, 74.58% for staff)

QUALITATIVE FEEDBACK

Rank	Preferred Aspects Categories	Critical Aspects Categories
1	Shortlisting Feature & Rec. Quality (24%)	Rote Selection of Papers (16%)
2	Information Cue Labels (15%)	Limited Dataset Issue (5%)
3	View Papers in Clusters (11%)	Quality can be Improved (5%)
4	Rich Metadata (7%)	Not Sure of the Usefulness of the Task (4%)
5	Ranking of Papers (3%)	UI can be Improved (3%)

- The newly introduced informational display features were a big hit
- The purely experimental nature of the study affected the experience of participants
- Task's effectiveness needs to be validated with a longitudinal study with a large collection of papers in the final reading list

LIMITATIONS

- Lack of an offline evaluation experiment
- Study procedure involved selection of comparatively fewer number of papers in the final reading list
- Not much variations in the final shortlisted papers for the different article-type preferences
- Information displayed in a purely textual manner

FUTURE WORK

- The scope for this task will be expanded to bring in more variations for the different article-type choices
- Inclusion of new papers in the output which could have been missed during the literature review
- Provide more user control in the system so that the user can select papers as mandatory to be shortlisted
- Integrate this task with the citation context recommendation task
- Represent the information in the form of citation graphs

GET ACCESS TO REC4LRW…

Click the link http://goo.gl/XgynzY or scan the below QR code

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